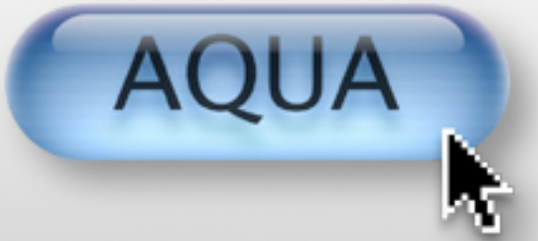
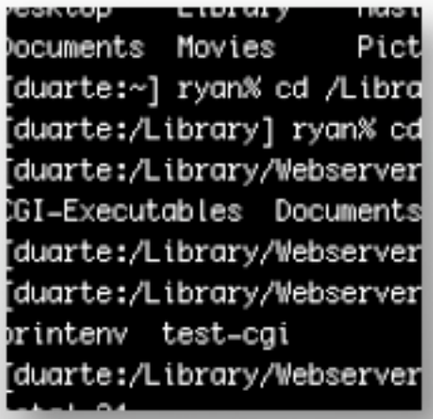
AppleScript Update

Session 401





AppleScript Update

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AppleScript Update

Todd “Chris” Fernandez

~~Todd Fernandez~~

AppleScript Engineering Manager

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Agenda

- Introduction
- What's new since WWDC 2002?
- What's under development for Panther?
  - New features
  - Scriptability enhancements
  - Documentation update

Introduction

What You Will Learn

- What the changes in AppleScript in Panther are
- How to take advantage of them to improve your scripts and applications
- How momentum is building for AppleScript on Mac OS X

Thank You

Developers!

Demo

QuarkXPress 6
Sal Soghoian

http://developer.apple.com/wwdc2003/urls.html

Version Summary

- 1.6 in Mac OS X 10.0
- 1.7 in Mac OS X 10.1, 9.2.2 Software Update
- 1.8 in December 2001 Developer Tools
  - 1.8.1 in Mac OS X 10.1.2
  - 1.8.2 in April 2002 Developer Tools
  - 1.8.3 in Software Update for Mac OS 9 and Mac OS X
- 1.9 in Mac OS X 10.2
  - 1.9.1 in Mac OS X 10.2.3
  - SE betas in December 2002 Developer Tools
- 1.9.2 in Panther

OSA Scripting in Panther

OSA Scripting in Panther

- Bundle formats for scripts and applets
- Scriptability enhancements
- Changes to be aware of
- AppleScript Studio

Bundle Formats

Bundle Formats

- New alternative to data and resource fork formats
- Use standard Mac OS X packaging
  - .scptd file packages for compiled scripts
  - .app application bundles for applets and droplets
- Supported by Script Editor, `osacompile`, and `store script`
- `osacompile` and `store script` can now create applets/droplets!
- Require Panther; old formats still supported

Advantages of Bundle Formats

- More flexible
  - Applets can be moved across file systems
  - Data can be stored with scripts
    - Pictures
    - Movies
- Persistent script attributes
  - Description
  - Window bounds and location

New OSA APIs

- ✅ New APIs to support all script file formats
- OSALoadFile
  - Loads a script file into a scripting component, determining the file format by inspection, and compiling if the input file is text
- OSAStoreFile
  - Stores a script into the specified file, determining the format by inspection

New OSA APIs

- OSALoadExecuteFile
  - Equivalent to OSALoadFile, OSAExecute
- OSADoScriptFile
  - Executes the file and updates it appropriately; Equivalent to OSALoadFile, OSAExecute, OSADisplay, OSAStoreFile (if the script has persistent properties)

Scriptability in Panther

Scriptability Enhancements

- Script Editor 2
- Folder Actions
- Script Menu
- Standard Additions
- AppleScript Runtime
- System Events
- GUI Scripting
- System Preferences
- Image Events
- PDF Workflow
- Cocoa Scripting

Script Editor 2

- Scriptable replacement for the venerable tool
- Incredible new technology:
  - Drag and drop!
  - Find and replace!
  - Scripts larger than 32K!
  - Undo!
- Open Dictionary… much faster
- Creates new applets in bundle format
- Saves existing applets in same format

Folder Actions

- Better than ever
- Contextual menu returns
- Folder Actions Setup
  - Shows all attached actions on the system
  - Provides UI for individual actions and scripts to be:
  - Enabled/disabled
  - Attached/removed
  - Edited

Script Menu

- Support for aliases, including to remote machines
- Support for applications, droplets, documents
- Selected folder opened in Finder
- Selected script with Option opened in Script Editor
- Hide/show Library scripts
- Display scripts specific to frontmost application
- Easily install in menu bar

Demo

Script Menu—Folder Actions—Script Editor 2

Tim Bumgarner
AppleScript Engineer

Standard Additions

- New parameters for `choose file`, `choose folder`
  - `default location` (also for `choose file name`)
  - `invisibles`
  - `multiple selections allowed`
- `choose color`
- `delay` accepts real numbers
- `do shell script` supports `as` parameter
- `info for` returns `kind`, `bundle identifier`
- `path to`
  - `Classic domain`
  - Long list of new special folder enumerations
- `read` handles Unicode text delimiters better

AppleScript Runtime

- Applets handle events FIFO instead of LIFO
  - AppleScript CGIs are now possible
- Idle handler return value can be real number
- Unicode constants more usable, e.g.,

```
set x to «data utxt00BE»
(x as Unicode text) & “ gallon”
-- result: “3⁄4 gallon”
```

- Date class enhancements

Date Class

- Added property `short date string`

```
short date string of (current date)
-- result: “6/23/03”
```

- Months can be coerced to numbers

```
month of (current date) as number
-- result: 6
```

- Months can be compared

```
if month of (current date) comes before July
--do something
end if
```

System Events

- System Events
  - All `application` classes merged into this suite
    - Adds properties `current user`, `startup disk`, `UI Elements enabled`
- Disk-Folder-File
  - Adds verbs `delete`, `open`
  - Adds classes `alias`, `disk item`, `domain`
  - `file` and `folder` are subclasses of `disk item`
  - Adds special folder properties to match `path to`
- Processes
  - GUI Scripting

GUI Scripting

What can you do with it?

- Automated GUI testing (Session 311)
- Limited way to work around apps lacking the object model scriptability you need

What is it?

- Not a substitute for object model scriptability
- Part of System Events Processes suite
  - Extends `process` class; adds `UI element` class
- `UI element` objects are familiar GUI widgets, e.g., buttons, sliders, windows

GUI Scripting

Limitations

- Disabled by default
- Extremely fragile when application's UI changes
- Cannot control non-standard interface elements
- Does not work well with non-English languages

Solutions

- Request object model scriptability from application developer
- Session 414: Making Your Carbon and Cocoa Application Scriptable

Image Events

What is it?

- Image: superset of ColorSync and Image Capture scriptability
- Events: faceless scriptable application

What can you do with it?

- Manipulate images and ColorSync profiles
  - Access image metadata
  - Add or change profile
  - Rotate, crop, scale images
  - Translate file formats

PDF Workflow

- Added in Mac OS X 10.2.4
- http://www.apple.com/applescript/print/
- Process saved PDF files with scripts from Print dialog
- Use open handler to receive references to saved files
- Add scripts to ‘PDF Services’ folder in Library folder

Mac OS X System Applications

Enhanced scriptability

- Address Book
- Finder
- iPhoto
- Mail

Newly scriptable

- iChat
- Xcode (demo in Session 306)

Demo

PDF Workflow
Scriptable Mac OS X System Applications

Cocoa Scripting

- Processing of Apple events or script commands can be suspended and resumed
- API to access the Apple event that is being handled
  - Errors can be returned from accessors or handlers
  - Subject and considering/ignoring parameters
  - `properties` is handled for you

Changes To Be Aware Of

Changes To Be Aware Of

- Using `path to me` in bundled applet results in path ending with a colon
- Default behavior of `offset of` standard addition

❌ Implicitly encoded text types should be avoided

✅ NSAppleScriptEnabled = YES required in Info.plist

Offset of Default Behavior

- In AppleScript 1.9.1 and earlier
  - Always considers case and ignores diacriticals
    - Opposite of AppleScript defaults
    - Did not honor `considering` or `ignoring` statements
- In AppleScript 1.9.2
  - Default behavior matches AppleScript defaults
  - Honors `considering` and `ignoring` statements

✅ Add `considering case` and `ignoring diacriticals` statements if your scripts rely on the old behavior

Implicitly Encoded Text Types

- ❌ Avoid using `typeText`
  - Incapable of representing international characters
- ❌ Avoid using `typeCString` and `typePString`
  - Incapable of representing international characters
  - Do not support full range of text coercions
  - Deprecated in Panther
  - Will be removed in future release
- ✅ Use `typeUnicodeText` instead

AppleScript Studio

AppleScript Studio 1.3

- Thanks for writing so many great Studio apps!
- New features
  - New property
  - New event handlers
  - Support for Xcode plug-ins
- Session 306: AppleScript Studio

Christopher “Chris” Nebel

~~Christopher Nebel~~

AppleScript Engineer

What We Talked About Last Year

- XML dictionaries (sdef)
- Carbon scripting
- Scriptable plug-ins
- Codeless terminology
- AppleScript X

What Shipped: sdef

- Shipped in Mac OS X 10.2
- Improvements to sdef and sdp in Panther
  - All backward-compatible
- Mail uses them in Panther
- Direct support in Cocoa Scripting coming

What Didn’t

- Codeless terminology
- AppleScript X

Carbon Scripting

- Carbon parallel to Cocoa Scripting
- Built around object methods, not accessor routines
- Does more for you than ObjectSupportLib

Carbon Scripting: Presto!

- Carbon Scripting is…Cocoa Scripting
- It just works
- It works on all versions of Mac OS X
- It supports scriptable plug-ins
- It is documented
- Session 414: Making Your Carbon and Cocoa Application Scriptable

Carbon Scripting: Fine Print

- Not free
  - Significant run-time costs
  - Writing glue may be hard
- Not perfect
  - Error handling
  - Some requests not handled efficiently

Summary

- sdef: already here and getting better
- Carbon Scripting = Cocoa Scripting
  - Handles scriptable plug-ins
  - Is it right for your application? (Session 414)
- Still to come: AppleScript X and codeless terminology

Documentation Update

Documentation Update

- Reference Library
  - Documentation
  - Technical Notes, Q&As
  - Sample Code
  - Other Resources
- Updated content in Panther Help Center
- Future
  - Language Guide update
  - Scripting interface guidelines

Reference Library

Documentation for Scripters

AppleScript Language Guide
ADC Home > Documentation > AppleScript >

AppleScript Release Notes
ADC Home > Documentation > AppleScript >

XML-RPC and SOAP Support
ADC Home > Documentation > AppleScript >

Reference Library

Documentation for Application Developers

Scriptable Cocoa Applications
ADC Home > Documentation > AppleScript >

Cocoa Scripting Release Notes
ADC Home > Documentation > AppleScript >

Carbon Specification for Open Scripting Architecture
ADC Home > Documentation > AppleScript >

Apple Event Manager Reference
ADC Home > Documentation > AppleScript >

Reference Library

AppleScript Studio Documentation

Building Applications With AppleScript Studio
ADC Home > Documentation > AppleScript >

AppleScript Studio Terminology Reference
ADC Home > Documentation > AppleScript >

AppleScript Studio Release Notes
ADC Home > Documentation > AppleScript >

Reference Library

Technical Notes

TN2065: “Do Shell Script in AppleScript”
ADC Home > Technical Notes > AppleScript >

TN2046: “AEStream and Friends”
ADC Home > Technical Notes > AppleScript >

TN2045: “AEBuild*, AEPrint* and Friends”
ADC Home > Technical Notes > AppleScript >

TN1164: “Native Scripting Additions”
ADC Home > Technical Notes > AppleScript >

Reference Library

Technical Notes (Cont.)

Interapplication Communication Technical Notes

ADC Home > Technical Notes > Interapplication Communications

Reference Library

Technical Q&As

AppleScript Q&As
ADC Home > Technical Q&As > AppleScript

Sample Code

Interapplication Communication
ADC Home > Sample Code > Interapplication Comm

Reference Library

Other Resources

AppleScript Website
http://www.apple.com/applescript/

Third-party AppleScript websites
Many available

“AppleScript in a Nutshell”
Published by O’Reilly & Associates

Other third-party books on AppleScript
Available in technical bookstores and online

Summary

What's next

AppleScript 1.9.2 in Panther

- Enhanced scriptability
- New tools

AppleScript X after Panther

Summary

What you can do with Panther Developer Preview

Application Developers

- Test your application for Apple event compatibility
- Take advantage of Cocoa Scripting enhancements
- Adopt new OSA APIs
- Start writing terminology using sdef

Scripters

- Prepare your scripts for the changes and test them

Who to Contact

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http://developer.apple.com/wwdc2003/urls.html

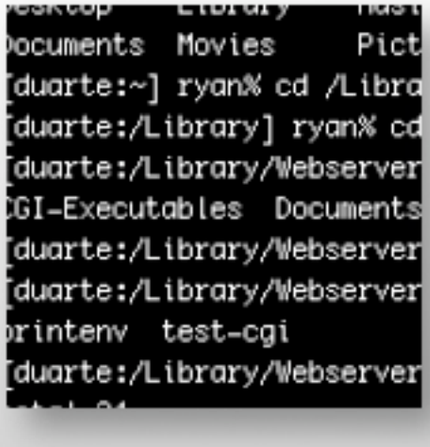
Roadmap

FF005 AppleScript Feedback Forum	North Beach Wednesday, 9:00am
718 AppleScript and QuickTime	SOMA Wednesday, 3:30pm
306 AppleScript Studio	Pacific Heights Wednesday, 5:00pm
414 AppleScript: Making Your Carbon and Cocoa Application Scriptable	The Presidio Thursday, 10:30am

Roadmap (Cont.)

311 Software Testing Tools for Mac OS X	Russian Hill Fri., 10:30am
623 AppleScript for System Administrators	Pacific Heights Fri., 2:00pm

Q&A



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http://developer.apple.com/wwdc2003/urls.html

WWDC 2003

Worldwide Developers Conference